

REMARKS

Claims 1-4, 6-10, 21 and 22 were pending in the subject application, with claims 5 and 11-20 having previously been canceled, without prejudice or disclaimer. By this Amendment, claims 2 and 22 have been canceled, without prejudice or disclaimer, claims 4 and 7 have been amended to correct obvious typographical errors therein, and claim 1 has been amended to clarify the claimed subject matter. Accordingly, claims 1, 3, 4, 6-10 and 21 are now pending and presented for reconsideration, with claim 1 being the sole pending claim in independent form.

Support for the amendments to claim 1 may be found, inter alia, in the specification at page 12, lines 10-19, and page 19, line 23 through page 20, line 8. Further support for the amendments to claim 1 may be found, inter alia, in claims 2, 11 and 14-16 as originally filed.

Applicant maintains that no new matter is presented by this amendment. Accordingly, Applicant respectfully requests that this Amendment be entered.

Rejection under 35 U.S.C. §112, second paragraph

In Section 2 of the February 26, 2007 Office Action, claims 4 and 7 were rejected under 35 U.S.C. § 112, second paragraph, as allegedly indefinite.

The Examiner stated that claim 4 was rejected because the claim should state "0.3% by mole or less" instead of ".30% by mole or less".

The Examiner stated that claim 7 was rejected because it is unclear what is meant by the range "50 to .95% by mole" because

0.95 is less than 50% by mole.

In response, claims 4 and 7 have been amended to correct the obvious typographical errors therein. The typographical errors are obvious particularly in view of the specification, [0030] and [0028].

Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the rejection of claims 4 and 7 under 35 U.S.C. § 112, second paragraph.

Rejection Under 35 U.S.C. § 102(a) / 35 U.S.C. § 103(a)

In Section 3 of the February 26, 2007 Office Action, claims 1-3, 6-10, 21 and 22 were rejected under 35 U.S.C. § 102(a) as purportedly anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as purportedly obvious over, Aoki et al. (EP 1 113 035).

The Examiner stated that Aoki teaches a solid electrolyte comprising a polymer formed of structural units represented by Formula (1) where z represents a residue of monoethylenically unsaturated compound and m represents a number average additions mols of a branched chain bound to the structural unit, -(RO)-, forming a main chain. The Examiner further stated that Aoki teaches a polymer which is obtained by polymerizing a monomer having an acid group to a compound represented by formula (2) to obtain polymer (A). The Examiner also stated that the compound of formula (2) which is used as the raw material can be obtained by polymerizing an alkylene oxide such as ethylene oxide or propylene oxide, etc., with an alcohol, alcoholating the resultant polymer and causing the alcoholated polymer to react with an alkyl chloride or an aryl chloride thereby substituting a

-OR1 group. The Examiner stated that the molecular weight may be preferably not more than 20,000. The Examiner further stated that Aoki teaches that another component can be added to the macromolecular solid electrolyte besides the polymer and the lithium salt such as plasticizers such as sulfolane, gamma-butyrolactone, ethylene carbonate, propylene carbonate, dimethyl carbonate, etc. and that the lithium salt is in the range of 5-70 mass%.

The Examiner alleged that any differences between claims 1-4, 6-10, 21-22 and the product taught by Aoki would have been obvious to one of ordinary skill in the art as a routine modification of the product in the absence of a showing of unexpected results.

The Examiner stated that the determination of patentability is based upon the product itself not upon the method of its production.

The Examiner alleged that any difference imparted by the product by process limitations would have been obvious to one having ordinary skill in the art at the time the invention was made because where the Examiner has found a substantially similar product as in the applied prior art, the burden of proof is shifted to the Applicants to establish that their product is patentably distinct.

Applicant maintains that Aoki does not render the claimed subject matter unpatentable because Aoki fails to disclose or suggest each and every element of the claimed subject matter.

A polymer gel electrolyte composition, as provided by the subject matter of amended claim 1 of the present application, has a semi-

interpenetrating polymer network structure, and comprises (I) a crosslinked polymer network matrix and (II) a non-crosslinked polymer penetrating the crosslinked npolymer network matrix. The polymer gel electrolyte composition contains 1 part by weight of the non-crosslinked polymer, 0.1 to 2 parts by weight of the crosslinked polymer network matrix and 3 parts by weight or more of the electrolyte solution. The crosslinked polymer network matrix has a three-dimensional crosslinked structure and contains a solution of an electrolyte in a non-aqueous solvent. The non-crosslinked polymer is obtained by esterifying a precursor polymer containing (a) an ethylene unit and/or propylene unit and (b) an unsaturated carboxylic acid unit, with a polyalkylene glycol compound having one terminal hydroxyl group protected, conducting the esterification until an amount of unreacted carboxylic acid in the precursor polymer becomes 5% by weight or less, in terms of acrylic acid, and thereafter removing unreacted polyalkylene glycol until a content thereof in the non-crosslinked polymer becomes 10% by weight or less.

The cited art does not teach or suggest such a polymer gel electrolyte composition.

Aoki (EP 1113035), as understood by applicant, proposes a macromolecular solid electrolyte containing a polymer represented by Formula (1). Aoki describes a methodology for preparing the polymer represented by Formula (1). However, all the monomers or compounds used to prepare the polymer react with each other in the methodology proposed by Aoki.

Aoki does not disclose or suggest a crosslinked polymer network matrix (which a non-crosslinked polymer penetrates).

Aoki does not disclose or suggest semi-IPN-type gel at all.

Also, Aoki does not disclose or suggest using 2 part by weight of a non-crosslinked polymer, 0.1 to 2 parts by weight of a crosslinked polymer network matrix and 3 parts by weight or more of an electrolyte solution.

As discussed previously, the polymer gel electrolyte composition provided by the subject matter of claim 1 of the present application has a gel structure that is a semi-interpenetrating polymer network type gel, a so-called semi-IPN-type gel, in which the non-crosslinked polymer is entangled in the crosslinked polymer network gel matrix (see application at page 4, lines 13-22 and page 19, line 23 to page 20, line 3).

Further, the polymer gel electrolyte composition provided by the subject matter of claim 1 of the present application can be produced by preparing a solution by adding the crosslinkable monomer to the solution of the electrolyte in the non-aqueous solvent, in which the non-crosslinked polymer has been dissolved, and subjecting the mixture to a reaction condition under which the crosslinkable monomer is crosslinkingly polymerized (see application at page 17, lines 10-17). The crosslinked polymer does not react in the crosslinking polymerization. As a result, the crosslinkable monomer forms a three-dimensionally crosslinked gel structure in which the electrolyte solution is contained, and the non-crosslinked polymer molecules penetrate the gel lattices of the gel structure.

Aoki does not teach or suggest such features, and therefore does not render claim 1 of the present application unpatentable.

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Regarding claims 3, 4, 6-10 and 21, applicant respectfully points out that claims 3, 4, 6-10 and 21 depend on and include all the limitations of claim 1. Thus, claims 3, 4, 6-10 and 21 are patentable at least for the reasons set forth above with respect to claim 1.

Since claims 2 and 22 have been canceled hereinabove, the rejection with regard to claims 2 and 22 is now moot.

Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the rejection of claims 1-3, 6-10, 21 and 22 under 35 U.S.C. § 102(a) and 35 U.S.C. § 103(a).

In view of the remarks hereinabove, Applicant maintains that claims 1, 3, 4, 6-10 and 21 are now in condition for allowance, and earnestly solicits the allowance of the application.

If a telephone interview would be of assistance in advancing prosecution of the subject application, Applicant's undersigned attorneys invite the Examiner to telephone them at the telephone number provided below.

If a petition for an extension of time is required to make this response timely, this paper should be considered to be such a petition.

No fee is deemed necessary in connection with the filing of this Amendment. However, if any fees are required, authorization is hereby given to charge the amount of any such fee to Deposit Account No. 03-3125.

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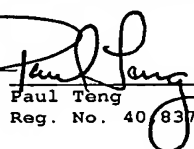
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Respectfully submitted,



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I hereby certify that this correspondence is being deposited this date with the U.S. Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.



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May 24, 2007

Date